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ABSTRACT

The documents surveyed in this review are limited in three ways: first, in many cases only the general terms "large" and "small" are used in the discussion of school size. Second, most of the studies deal with secondary schools because there is greater concern with the extent of curriculum offerings at that level. Third, many authors draw conclusions from studies of school district size. This is understandable because the data available on district size are often more accurate and more complete than those on school size. School district data are used on the assumption that most small districts are in sparsely populated areas and have small schools, whereas the opposite is true for large districts. This review divides the literature into (1) school size and educational costs, (2) size and student achievement, (3) advantages and disadvantages of small schools, (4) advantages and disadvantages of large schools, and (5) opportunity and actualization factors. Nine of the documents reviewed are available from the ERIC Document Reproduction Service. (Author)

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School Size

Ian Templeton

> Comprehensiveness is often equated with size because it is easier to provide the variety of courses, facilities, programs and teachers associated with comprehensiveness in a large than in a small school. Comprehensiveness—and size—has also become, for many, synonymous with excellence. . . . It is apparent, however, that some large schools with many resources are not very good, whereas some quite small schools have very fine reputations. Obviously size is not the whole story, and even if it were, there are many children—the "geographically disadvantaged"—who have little alternative but to attend schools that are relatively small, and who in justice, must have their educational needs satisfied to as great a degree as possible.
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> *Washington State Temporary Special Levy Study Commission (1971)*

Educators have generally assumed that schools providing broad curricula, teachers with advanced degrees, and specialized facilities and programs offer greater educational opportunities than do schools deficient in some of these areas. This assumption favors large schools with broad tax bases and flexible budgets because these schools are most likely to be in a position to finance such personnel and programs.

Recently, some writers have challenged both the assumption and its implication that the presence of opportunities indicates the quality of the education students receive. At the heart of this contention is the understanding that opportunities ignored, withheld, or, for whatever reason, unrealized do not increase the quality of a student's education.

This challenge further complicates consideration of the traditional size-related variables such as finance, student achievement, and adequacy of facilities and programs. Each size-related variable must be considered both alone and in conjunction with others. For instance, it is important to establish the school size that correlates best with low per pupil expenditures, but it is also necessary to consider how that size compares with the sizes that best promote student achievement, student participation in extracurricular activities, and other variables.

Because studies of school size deal with such an extensive number of variables, no completely uniform figures can be offered for an optimum size. In general, however, the literature favors elementary schools in the 300 to 800 student range and high schools in the 800 to 1,200 range.

The documents surveyed in this review are limited in three ways: first, in many cases only the general terms "large" and "small" are used in the discussion of school size. Second, most of the studies deal with secondary schools because there is greater concern with the extent of curriculum offerings at that level. Third, many authors draw conclusions from studies of school district size. This is understandable because the data available on district size are often more accurate and more complete than those on school size. School district data are used on the assumption that most small districts are in sparsely populated areas and have small schools, whereas the opposite is true for large districts.

This review divides the literature into five sections: school size and educational costs, size and student achievement, advantages and disadvantages of small schools, advantages and disadvantages of large schools, and opportunity and actualization factors.

Of the documents reviewed, nine are available from the ERIC Document Reproduction Service. Complete instructions for ordering documents are given at the end of the review.

School Size and Educational Costs

Using school district data and a generalized theory of size-cost relationships in institutions, Rosenberg (1970) formulated three research hypotheses to test in his study of school size and costs:

1. As school population size increases from zero, teacher cost per pupil first rapidly decreases, and then slowly levels out to a flat minimum.
2. As school population size increases from zero, administrator cost per pupil first slowly, then more rapidly increases.
3. As school population size increases from zero, total cost per pupil first rapidly decreases, then more slowly decreases to a minimum, and finally gradually increases.

He tentatively accepted the first hypothesis, rejected the second, and neither rejected nor accepted the third because it is based on the first two.

Rosenberg concludes that per pupil expenditures in high schools with 90 to 259

students are very little more than in schools three or four times as large and that high schools of approximately 400 students appear to be economically feasible.

Also dealing with the cost-size relationship on the district level, Sabulao and Hickrod (1970) examine two basic research theories:

- Expenditures per student decrease as the size of the school increases.
- The first theory holds only to a certain enrollment level at which point the greater complexity of the school increases expenditures per student.

The authors found the second theory to be more nearly correct. The optimum district size in terms of per student operating expenditures was 750 students in an elementary district (K to 8), 500 in a secondary (9 to 12), and 5,000 in a unit district (K to 12). The authors caution that these figures may pertain only to Illinois schools.

The results of the Sabulao and Hickrod study are confirmed by research reviewed by Turner and Thrasher (1970), who conclude it is not true that costs per pupil are smaller for larger schools. They cite two studies indicating that optimum high school size is in the 800 to 1,200 student range. Increasing size over 1,200 does not result in decreased per pupil expenditures, and certain negative factors begin to appear. One study does note, however, that small high schools (under 200 students) must pay high costs while maintaining an inferior program.

An Educational Research Service information aid (1971) summarizes fifty years of studies and recommendations on the size of elementary, junior high, and senior high schools. The studies are presented in a chart that considers the source of the study, the recommendations on size, the educational factors studied, and the universe of the study. In questioning the use of per pupil costs as an indicator of school quality, the report lists certain factors for each of the 1968 ten "top" high schools in America as determined by a panel of educators.

The schools range in size from 1,365 to 5,724 students (housed in two separate buildings). The per pupil expenditures range from $450 to $1,300. In one instance, a school with 2,037 students spent more than twice as much per pupil as a school with 2,050 pupils. The document notes an important consideration about per pupil cost—it is not really a measure of "cost" so much as a measure of a community's ability and willingness to finance education.

The Educational Research Service publication is not alone in questioning the value of per pupil costs in determining optimum school size. Clements (1970) observes that most cost studies do not consider student-teacher ratios or the high per pupil transportation cost of small rural high schools. Kiesling (1968) reports that urban (as opposed to big city, rural, and small town) districts have the highest average figures for performance and the lowest for average expenditures and, thus, seem to be getting the most return for money spent. He notes, however, that urban districts also have the highest socioeconomic index and that there

is considerable evidence that large high schools are less efficient than small schools.

The Washington State Temporary Special Levy Study Commission (1971) observes that the literature generally favors elementary schools in the 300 to 400 pupil range and that the literature dealing with cost favors high schools in the 1,000 to 1,500 pupil range.

School Size and Student Achievement

The Minnesota Public School Survey Committee ([1969]) reports a comparison, by school size, of student scores on the Minnesota Scholastic Aptitude Test (MSAT). All high school juniors who were attending Minnesota public schools and had taken the MSAT during the 1966-67 school year were studied. Analysis of the data indicated a direct correlation between high school size and mean raw scores on the test, with students in smaller school systems doing more poorly than students in larger school systems. The committee notes, however, that the educational level of the students' fathers could have accounted for this correlation. Tabular material is presented on enrollments, test results, educational and occupational status of the fathers, and family attitudes.

In another high school-oriented study, Kiesling (1968), using Project Talent data, observes that the relationship between high school size and student achievement seems to be maximum in the 1,200 to 1,600 student population range. When his three control variables (expenditures, intelligence, and socioeconomic index) are introduced, however, the relationship between size and achievement becomes negative. The author suggests this outcome can be explained by positing that students in medium-sized schools are either more intelligent, come from higher socioeconomic backgrounds, or both.

A portion of the Washington State Temporary Special Levy Study Commission (1971) report reviewed the literature on the relationship between school enrollment and pupil achievement. The literature generally supports elementary schools of 300 to 400 pupils and discloses that achievement is highest in secondary schools of slightly more than 1,000 students. Not only did studies of secondary student achievement and dropout rates favor large high schools; studies done at the college level also support their conclusions. Three categories of university student achievement—student success, dropout rate, and Ph.D.s earned—all favored students from large high schools.

Advantages and Disadvantages of Small Schools

Studies of per pupil expenditures and student achievement measure only two areas in which school size affects the educational opportunities available to students. Other factors, such as range of classes, special services, extracurricular activities, organizational climate, intraschool communication, and the like, are also important indicators of educational opportunity.

In a discussion of problems and progress in rural education, McClurkin (1970) intro-

duces some of these other relationships. He notes that money available on a competitive basis is generally out of reach of the rural school because of the lack of time and talent necessary to obtain the funds. Teachers are often undertrained, holding "Life Certificates" earned with less than four years of college. Special services such as guidance and hot lunch programs are lacking because funds are not available to support them. Course offerings are limited by class size and teacher qualifications. Vocational education is restricted to agriculture. Nine out of ten students leave the farm without the training needed for employment in the city because course offerings serve only the college-bound student.

However, there are some trends that hold promise for rural youth. The number of one-room schools is declining. Regional service centers or intermediate units are bringing new resources to rural areas and providing such services as diagnostic clinical facilities and specialized personnel. McClurkin also discusses ways to expand innovative programs in rural schools, as well as new programs designed for nonurban schools.

Among the school-size related characteristics studied by the Educational Research Service (1971) are curriculum offerings, special services, professional personnel, pupil and staff relationships, percentage of graduates entering college, and extracurricular activities. Conclusions, based on a review of the literature, do not uniformly favor large schools. For instance, research indicates that the usual tests of staff qualifications (degrees, certificates, and experience) do not conclusively establish a direct relationship between these qualifications and quality of teaching or administration. Pupil and staff relationships can be good in small (292 to 490) as well as in large (2,000) schools. The number of graduates going on to college does not reflect the appropriateness of the education provided to the needs of the community served. Although large schools offer more variety of extracurricular activities, student participation is higher in small schools.

A report on field studies of high school students' sense of obligation to nonclass school activities (Willems 1967) supports findings that small schools have some advantages. "Sense of obligation" is thought to mediate some relations between the student and the school environment and is defined as a personal feeling of "I ought to . . ." or "I must . . . ," that is, a personal constraint, with reference to attending and helping with group activities. Two samples of marginal (poorly suited) and regular (better suited) students in small and large schools were interviewed concerning "reasons for or pulls toward" attending selected nonclass activities. Responses were coded into categories indicating sense of obligation. Marginal students in small schools reported as much sense of obligation as regular students, whereas marginal students in large schools reported little if any. Theoretical and methodological implications are discussed, and tables and charts summarize the data.

In the first section of his paper, Clements (1970) surveys the literature on the school-size controversy. Another section of the document is devoted to subjective consid-

eration of the school characteristics that often favor small high schools. These factors include pupil-teacher ratios, curricular offerings, co-curricular participation, transportation, teacher quality, and school atmosphere.

Advantages and Disadvantages of Large Schools

Although Hickey's (1969) summary of research findings is on the relationship between school district size and certain educational factors, his conclusions reflect what is usually held to be true for school size. He notes a strong positive relationship between size and the following:

- per pupil costs
- pupil achievement
- breadth and quality of programs (measured in various ways)
- quality of teachers

The conclusions Wakefield and others (1968) draw from a survey of the literature tend to support Hickey's findings. The advantages of large secondary schools are usually attributed to schools in the 700 to 1,200 range. Schools with over 1,200 students do not seem to benefit from their increased size. The advantages of large high schools are summarized as follows:

(1) Better faculty
- qualifications
- compensation
- stability

(2) Better conditions
- more efficient administration
- lighter teaching loads
- more resource persons
- lower teacher-pupil ratio
- more materials and equipment

(3) Better programs
- more opportunity to experiment
- more courses
- more extracurricular activities

The authors note that the disadvantages cited in the literature are usually less specific than the advantages, more difficult to document, and usually come from studies of high schools with fewer than 1,000 students. The disadvantages are as follows:

- less personal contact between students and teachers
- questionable psychological effects on students
- lower participation in extracurricular activities
- weaker staff communication

Turner and Thrasher (1970) also review literature relating school size to school effectiveness. They found evidence that large schools offer only slightly more varied programs than do small schools; hence, small size alone is not necessarily a limiting factor in the breadth of the curriculum offered. Large schools also tend to reduce the proportionate number of student leaders in a school, and have sizeable groups of "outsiders" that are not found in small schools. The authors cite research that found no significant difference in scores on the Iowa Test of Educational Development among students from four categories of school sizes. The same research notes no significant differences in the grade points earned by college freshmen from various sized schools.

It was found, however, that staff turnover and the number of teachers teaching in their major field both significantly favored large schools.

Gentry and Kenney (1967) investigated the relationship between the organizational climate in 221 elementary schools and:

- classification of the school by its urban, suburban, or rural location
- school size as measured by number of professional staff members
- economic level of the community served by the school

An organizational climate description questionnaire measured teacher perception of faculty interaction (disengagement, hindrance, esprit, intimacy) and teacher perception of leader behavior (aloofness, production, emphasis, trust, and consideration). These eight dimensions formed six different types of organization climate—open, autonomous, controlled, familiar, paternal, and closed.

Rural schools were perceived as having a closed climate more frequently than urban and suburban schools were, however, 22 percent of the rural schools were seen as familiar. Limited financial resources, lack of community activity, and heavy migration of young talent might influence rural ratings.

There was a discernible relationship between school size and organizational climate, though it was not found to be statistically significant. As the school size increases, the climate moves toward the closed end of the continuum. Low income schools were perceived by their teachers as closed.

Conclusion: Opportunity and Actualization Factors

The Washington State Temporary Special Levy Study Commission (1971) concludes that there is no simple relationship between school size and quality, though it is generally agreed that very small schools cannot compete favorably with larger schools.

The commission's conclusion is based on a consideration of opportunity and actualization factors in schools. Opportunity factors are usually things—courses, programs, equipment, and facilities—that increase with the size of a school. Actualization factors tend to be people-oriented and provide the motivation or stimulation that enables a student to take advantage of the opportunities provided. Some actualization factors are independent of the school and school size; for instance, the student's socioeconomic status and innate drive to succeed.

Discussion of the opportunity and actualization factors of a school rests on four assumptions:

- The performance or worth of a school is measured by the success of the student; this, in turn, is determined by how well he can exercise his options for future development.
- In society's view, the practical worth of a school that offers large opportunity only partially realized is little different than the worth of one that offers less opportunity more fully realized. (If indices representing opportunity and actualization were available, the worth of the school would be related to the product of the two factors.)

- Many of the factors affecting the motivation of students are outside the control of the school. They are frequently spoken of, when negative, as a deficit in the student for which the school must somehow compensate. Part of the crisis in public school education today arises from the difficulty of compensating for these deficits.
- Many of the serious problems of large schools are not problems intrinsic to bigness. More often they stem from economic or other conditions in the urban community, which give rise to societal problems and overcrowding in both community and school. From these emerges a high incidence of educational deficit.

Although large schools tend to provide more educational opportunities than do small schools, they do not necessarily excel in actualization. Actualization factors working against large schools include the formality that such schools require, and a loss of interpersonal relationships among faculty, staff, students, and administrators. Also, large schools are often urban schools subject to certain sociological factors that work against actualization. Two of these involve socioeconomically disadvantaged students from ghettos and unmotivated students typical of large suburban and city schools.

The commission presents a quantitative chart of "average school" performance and uses it to make five points on the effect size has on schools:

1. High schools having an enrollment in the mid-range do not differ significantly in performance. This is because increased educational opportunity is offset by factors which hinder attainment of that opportunity.
2. The average small school may not be at too great a disadvantage when compared with its counterpart in the mid-range.
3. As the school enrollment becomes very small, it is very difficult for it to compete with larger schools. In the small classes, personal attention tends to narrow the range between good and poor schools, but the fundamental opportunity is significantly less.
4. A high performance smaller school may be far superior to a much larger school whose performance is even average; however, schools are like boxers: a good big one will almost always beat a good little one.
5. It must be remembered that the school provides only part of the capability that an individual requires to exercise options for his continuing development. Where the educational opportunity is low, nonschool activities in the family or community may in some cases replace what is missing. On the other hand, where educational opportunity is high but not being realized, it is unlikely that other resources will compensate.

The commission concludes that large schools are usually better than very small schools but that size is only important in the case of very small schools. In the case of larger schools, nonsize factors tend to "swamp out" size effects.

In considering optimum school size, then, actualization factors should be considered as well as the suggested student population figures offered throughout this review.

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RESEARCH HIGHLIGHTS

Per pupil cost is not really a measure of "cost" but a measure of a community's ability and willingness to finance education. *Educational Research Service (1971)*

Expenditures per student decrease as school size increases only up to a point at which the school's greater complexity increases expenditures. *Sabulao and Heckrod (1970)*

Marginal students in small schools have as much sense of obligation to extracurricular activities as regular students, but marginal students in large schools have little if any sense of obligation to such activities. *Willems (1967)*

Pupil-teacher ratios, curricular offerings, cocurricular participation, transportation, teacher quality, and school atmosphere are among the factors favoring small schools. *Clements (1970)*

Such considerations as a student's socioeconomic level and innate drive to succeed are independent of the school and school size. *Washington State Temporary Special Levy Study Commission (1971)*

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